

# FILE COPY

May 23, 1986

TO: Technical File

FROM: Dave Cline, Reclamation Hydrologist *RS for DC*

RE: Application for a Permit to Construct and Operate Tailings Ponds for the Trixie Mine, Sunshine Mining Company, ACT/049/009, Utah County, Utah

Summary: On December 20, 1985 the Sunshine Mining Company submitted a proposal to construct tailings ponds for the Trixie Mine. On January 21, 1986 the Division responded to Sunshine's proposal with a deficiency letter. Included in the deficiency letter were comments made pursuant to Rule M-3 and Rule M-10 concerning the diversion of the runoff from the undisturbed watershed around the tailings ponds. Also on January 21, 1986 Rick Summers and Dave Cline of the Division met with Mr. Glenn Mellor of Sunshine at the Trixie Mine and discussed the procedures for designing the diversion (see field memo dated January 22, 1986). On January 30, 1986 Sunshine submitted a response to the January 21, 1986 deficiency letter. This response was also found to be deficient by the Division and a letter was sent to Sunshine on February 5, 1986 which included peak flow values for the undisturbed watershed. Sunshine resubmitted their designs for the diversion on March 25, 1986. The Division has reviewed this latest submittal and has determined it to be complete and technically adequate.

Recommendations: The Application for a Permit to Construct and Operate Tailings Ponds for the Trixie Mine has been reviewed by Division hydrologists Dave Cline and Rick Summers. It has been determined to be complete and technically adequate as required by the Oil and Gas Conservation Rules and Regulations and Rules and Practice and Procedure (Amended to January 1, 1982) by Order of the Board of Oil, Gas and Mining. Therefore it is recommended that this application be approved pursuant to the hydrology regulations.

Supporting Documentation: Attached

cc: Sue Linner  
Rick Summers

7000R-4

Project: Sunshine Mining Co., Application to  
Construct Tailings Pond for Triton Mine

Date: 5/22/96

Reviewer: Dave Clive, Hydrologist

Purpose: to verify pk flows and diversion designs  
for diverting undisturbed runoff from  
watershed above ponds.

PK Flow - see attached tech memo dated  
1/31/86 by Rick Summers  
results:  $Q_{10-24}$  1.85 cfs  
 $Q_{100-24}$  16.02 cfs

Diversion design - proposal - trapezoidal ditch  
bottom width = 2.75'  
slope = .0485  
 $n = .024$   
100-yr 24hr event  
review = for 100  
tip up = 11"

	Manning's				
	depth	area	R	velocity	Q
critical flow	.50	1.52	.35	6.77	10.29
	.55	1.68	.38	7.15	12.01
	.60	1.86	.41	7.52	13.93
	.65	2.03	.43	7.76	15.75
	.70	2.21	.46	8.12	17.94

velocity  $\approx$  8.0 fps @  $d \approx .68$  ft

from riprap chart (US Bureau of Reclamation, Design of Roadside Drainage Channels, 1965)

$v = 8 \text{ fps} \Rightarrow 11'' \text{ diameter riprap}$   
 $\therefore$  approve design

for non critical segment  
 $S = .0525$   
 $A = .030$

depth	area	R	V	Q
.65	2.03	.43	6.51	13.21
.70	2.21	.46	6.81	15.05
$\rightarrow$ .75	2.38	.48	7.01	16.68 $\leftarrow$
.80	2.43	.49	7.10	17.25

$v \approx 7.0 \text{ fps}$  @  $d \approx .72 \text{ ft}$

from riprap chart (see above)

$v = 7.0 \text{ fps} \Rightarrow 8'' \text{ diameter riprap}$   
 $\therefore$  approve design

Project: Sunshine Mining Co., Peak values for tailing  
diversion.

Date: 1-31-86

Reviewer: R. Summers, Hydrology

### I Assumptions & Inputs:

- 1) CN = 69.6 use 70
- 2) Ppt. depths: (Type II storm)  
10yr = 1.70  
25yr = 2.20  
50yr = 2.50  
100yr = 2.85

Reference  
Attach C, 1-30-86 submitted

Miller, et al., 1973

- 3) Watershed Area (yellow line)  
in<sup>2</sup> = 48.01  
ft<sup>2</sup> = 1,920,400.0 ft<sup>2</sup>  
Acres = 44.09 Ac.

Sketch of Proposed  
Facilities Reclamation  
Areas " 1:200  
Scale Map.

- 4) Hydraulic length (Blue line)  
21.35 in = 4,270.0 ft.

- 5) Watershed Slope

$$S_B = \frac{hL}{A}$$

$$\begin{aligned} L &= 61.5' \text{ inches} \\ &= 12,300.0 \text{ ft.} \\ h &= 2.5' \\ A &= 1,920,400.0 \text{ ft}^2 \end{aligned}$$

where:

$h$  = contour interval  
 $L$  = length of contours  
in Basin  
 $A$  = Area of Watershed

$$\% = 16.51 \%$$

II. Results	(CFS)
40-24	1.85
25-24	6.60
10-24	17.59

$$* T_c = 0.564 / \text{mi.}$$